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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,144	06/26/2001	Robert J. Schroeder	60.1413	2201

7590 03/22/2004

Intellectual Property Department
Schlumberger-Doll Research
Old Quarry Rd.
Ridgefield, CT 06877

EXAMINER

LEE, JOHN D

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/892,144

Applicant(s)

SCHROEDER, ROBERT J.

Examiner

John D. Lee

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

(RCE)

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

A request for continued examination under 37 CFR § 1.114, including the fee set forth in 37 CFR § 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR § 1.114, and the fee set forth in 37 CFR § 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR § 1.114. Applicant's submission, filed on January 22, 2004, has been entered.

Claims 1, 20, 24, 26, and 27 are objected to because of the following minor informalities: in claim 1, line 4, the phrase "and being arranged to carry signals outputted from the optical sensor and the non-optical sensor" has been omitted prior to the new insertion; in claim 20, line 8, the designation "e)" should actually be "d)"; in claim 24, line 1, "the non-optical fiber sensor" should actually be "the non-optical sensor"; in claim 26, line 2, the phrase "from a plurality of optical signals" should be deleted; and claim 27 (as presented in the amendment) does not correspond to the originally presented claim 27. The Examiner will treat the original version of claim 27. Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication 2002/0119271 A1 to Quigley et al. Refer to the appropriate drawings or parts of the specification. Quigley et al discloses a composite spoolable tube with sensor that discloses all the limitations of the above-mentioned claims. Regarding claim 1, Quigley et al discloses a sensor telemetry system ("Summary of Invention" and figures 21-23) comprising: at least one optical sensor (paragraph 22, line 4); at least one non-optical sensor; an optical fiber coupled (paragraph 28, lines 3 and 4) with the optical sensor and the non-optical sensor and being arranged to carry signals outputted from the optical sensor and the non-optical sensor. Quigley et al further discloses that the optical sensor is an intrinsic fiber optic sensor (paragraph 21, line 3), more specifically a Bragg grating (paragraph 23, line 6), as explained in claims 2 and 3. As to claim 4, Quigley et al discloses that the optical sensor comprises one of the sensor types enumerated in the claim (paragraph 22). Quigley et al still further discloses that the non-optical sensor comprises one of the sensor types enumerated in claim 5 (paragraphs 22 and 24).

Claims 6-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication 2002/0119271 A1 to Quigley et al. Refer to the appropriate drawings or parts of the specification. Quigley et al, as explained above,

discloses essentially all the limitations of the claimed invention. Quigley et al discloses a detector (fig. 22, **100**) coupled to the optical fiber (**70**) at the surface of the oilfield, which is further coupled to an optoelectronic device (fig. 23, **86**) and wherein a source (**98**) is optically coupled (**96**) to the fiber, as described in claims 9-11, 18, and 19. Regarding part of claim 12, as well as claim 13, Quigley et al discloses that the telemetry system is used as an oilfield monitoring system (paragraph 14) deployed in an oilfield, wherein the borehole (fig. 20) traverses the oilfield. However, the reference does not explicitly disclose a converter coupled to the non-optical sensor.

On the other hand, one of ordinary skill in the art would have recognized that in order for a non-optical sensor to be coupled to an optical fiber properly, the non-optical signal would necessarily be converted into an optical signal for transmission on the optical medium. In addition, electro-optic conversion devices (such as piezoelectric elements disclosed in the reference) are the most well known types of converters. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a converter to couple the non-optical sensors to the optical fiber, as explained in claims 6, 7, 17, and 24.

Additionally, because the non-optical sensors would need to be coupled by a conversion element to the optical fiber, they would be located remotely from the optical fiber, as an inherent property of being coupled through the conversion element, as mentioned by claims 14 and 15.

With reference to claims 8 and 16, using a Bragg grating encircled by a coating (such as piezoelectric coating, see paragraph 71), is a well-known means of converting

mechanical strain in a non-optical sensor to an optical signal for transmission. As to claims 25 and 27, Quigley et al's Bragg grating sensor(s) functions by modifying the source wavelength(s) according to the applied strain(s) (paragraph 159 and 160). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a Bragg grating and a coating (such as a piezoelectric element) as a means of converting the non-optical signal.

Although the reference does not explicitly state that the first and second optical signals are demodulated, as mentioned in claim 20, Quigley et al shows a signal processing unit at the surface of the oilfield for receiving the optical signals (fig. 23, **86**). In order to derive the geophysical information from the optical signal, the signal processing unit would have to demodulate and/or demultiplex the two sets of optical signals from the optical and non-optical sensors (claim 26). Additionally, wavelength-, frequency-, and time-division multiplexing (claims 21-23) are well known means for modulating information onto an optical signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the device disclosed by Quigley et al would need to demodulate the optical signal, in the time, frequency, or wavelength domain, in order to derive information about the physical parameters being sensed.

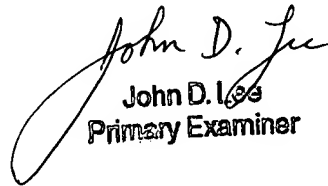
The **REMARKS** filed with the request for continued examination on January 22, 2004, have been fully considered but they are not deemed to be persuasive. Applicant argues that Quigley et al does not anticipate or make obvious the presently claimed invention because there is no motivation or suggestion in the reference to use a

common telemetry to transmit signals outputted from different sensors responding to different environmental effects (emphasis by applicant). The Examiner strongly disagrees. The Examiner believes that Quigley et al does, indeed, suggest the use of a common telemetry to transmit signals outputted from different sensors responding to different environmental effects. At many places throughout the document, Quigley et al clearly describes such an arrangement: see paragraph [0026] for example, wherein Quigley et al states that “[the] first sensor and any additional sensors can be distributed along the length of a single energy conductor”. It is clear that these “first sensor and any additional sensors” can be any combination of the optical sensors (described, for example, in paragraph [0023]) and the non-optical sensors (described, for example, in paragraph [0024]). It is easy to see that some of these sensors detect environmental effects (e.g. reflectance, radiative loss, etc.) that are different from environmental effects (e.g. temperature, strain, etc.) detected by others of the sensors. The rejections (above) have clearly explained how the non-optical sensors convert to optical information for transmission. The logical conclusion, then, as set forth in the rejections above, is that Quigley et al suggests embodiments of the sensor arrangement which include the use of a common telemetry (optical fiber) to transmit signals outputted from different sensors (optical sensors and non-optical sensors) responding to different environmental effects.

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. The Examiner’s normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general

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or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 2) at telephone number (703) 308-3072, or to the Technology Center 2800 Customer Service Office at telephone number (703) 306-3329.



John D. Lee
Primary Examiner